

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Face Masks for use in the administration of Oxygen and other Gases

I, GEORGE WILLIAM HIGGS, a British Subject, of 8, Duke Street, Wigmore Street, London, W.1, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to face masks for use in the administration of oxygen and other gases, and has for its object to provide a simple form of mask capable of being produced at a low enough cost to justify its being discarded after being used only once, thus avoiding the need for sterilization.

According to the invention, a face mask comprises a bag of flexible substantially gas-proof material into the open side of which the nose and chin of a person are to be inserted, means for holding the bag in position on the wearer's face with one side of the opening held firmly under the chin, a deformable substantially non-resilient wire or bar extending along the other side of the opening and adapted to be bent to shape that edge of the bag into conformity with the contour of the wearer's face, an inlet for connecting the bag to a gas supply, and outlet orifices in the wall of the bag.

The face mask may include an inner bag located within a main bag of greater depth, the mouths of the two bags being co-extensive, the gas inlet leading into the main bag and the outlet orifices leading directly from the inner bag to the atmosphere, whilst further orifices are provided in the inner bag to provide communication between the two bags.

The invention is hereinafter described with reference to the accompanying drawings, in which:—

Fig. 1 is a plan view of one form of face mask according to the invention;

Fig. 2 is a section on the line 2-2 of Fig. 1.

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1, the mask being shown with its sides slightly separated;

Fig. 3 is a view showing one of the sheets of material of which the mask shown in Figs. 1 and 2 is made;

Fig. 4 is a pictorial view showing a mask as illustrated in Fig. 1 in position on the face of a wearer;

Fig. 5 is a detail view showing a modification; and

Figs 6 and 7 are views similar to Figs. 1 and 2 respectively of a simplified form of mask, Fig. 7 being a section on the line 7-7 of Fig. 6.

Referring to Figs. 1 to 4, the face mask shown in these figures is formed from two similar sheets 10 and 11 of plastic sheet material such as polyvinyl chloride, polythene or that sold under the Registered Trade Mark Alkathene, each of the sheets being of the shape shown in Fig. 3. The ends of the pieces may be tapered, as shown, or may be rounded. The two pieces are secured together round their edges, for example, in the case of polyvinyl chloride by the process known as "welding," along a line 12. Other materials, to which the so-called "welding" process is not applicable, may be secured together in any suitable manner. A short length of plastic tubing 13 is placed between the edges of the sheets 10 and 11 at one end, as shown, and is secured by "welding" along lines 14 on each side of it.

Before the sheets are secured together, holes 15 are formed in the sheet 10, near the end remote from that at which the tubing 13 is to be located, these holes being shown in full lines in Fig. 3. The sheet 11 is pierced to provide two holes 16, the sheet being reinforced at the holes 16 by securing small additional pieces of the same material to its surfaces. The holes 16 are shown in dotted lines in Fig. 3.

The end 17 of the unit formed by the

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two sheets is then folded into the other end by folding along the line 18 in Fig. 3, thus forming an inner bag 19 (Fig. 2) and a larger main or outer bag 20, the 5 holes 16 being in the outer bag adjacent the fold. A length of aluminium wire 21, with its ends bent into loops 22, is located in the fold of the sheet 11, and a piece of elastic cord 23, having its ends tied to- 10 gether to form a closed loop, passes through the holes 16 so as to have an internal portion lying in the fold of the sheet 10, and an external portion extending between the holes 16. The elastic cord 15 23 passes through the loops 22 in the wire 21. The inner and outer folds of each of the sheets 10 and 11 are then "welded" together continuously as shown at 24, or at intervals, along lines adjacent and 20 parallel to the lines 18, so that channels are formed to retain the wire 21 and cord 23 in position. The inner and outer folds of the sheet 11 are also "welded" together over a small area at 25, and two holes 26 25 are pierced within the area where they are welded together.

As shown in Fig. 5, the wire 21 may be replaced by a strip of aluminium 27 on the ends of which are fitted short plastic 30 sleeves 28, the cord 23 passing through the sleeves 28. Other ductile metal, in wire or strip form, may be used instead of aluminium, and it may be coated with plastic material.

35 The mask is fitted, as shown in Fig. 4 of the drawings, by placing that side of the mouth of the bag in which the cord 23 is housed under the chin, passing the external portion of the cord loop 23 over the 40 top of the head until it extends round the head just above the ears, and bending the wire 21 (or strip 27) to bring the other side of the mouth of the bag into conformity with the contours of the face across 45 the cheeks and over the bridge of the nose. The tubing 13 is connected to a supply of oxygen through a conduit 29. The holes 26 connect the inner bag to the atmosphere, and the holes 15 provide communi- 50 cation between the inner and outer bags.

As the wearer breathes, some of the air which is exhaled passes out through the holes 26 into the atmosphere, the rest passing through the communicating holes 15 55 into the main bag 20, where it mixes with oxygen supplied through the tubing 13, the air from the main bag, with the added oxygen, being re-breathed by the wearer.

The simplified mask shown in Figs. 6 60 and 7 comprises only a single bag 31 the edge of which, at the mouth 32, is folded over to form a channel 33 to receive a wire 34 and elastic cord loop 35 as previously described. The bag 31 is formed 65 from two sheets 36 and 37 of plastic sheet

material, "welded" together at the edges, and having a piece of tubing 38 fitted at the bottom of the bag to provide an oxygen inlet. Outlet holes 39 are provided in one side of the bag. The mask shown in Figs. 70 6 and 7 is worn in the same way as that previously described, but the mixing of the oxygen with the exhaled air takes place in a space (the interior of the single bag) which is directly connected to the atmos- 75 phere through the holes 39.

The above described arrangements are only examples, and the face mask according to the invention may be modified in shape or construction without departing 80 from the scope of the invention. For example, where both inner and main bags are used, the main bag may be much larger in comparison with the inner bag than in the form illustrated, and the 85 main and inner bags may be formed separately and subsequently secured together.

What I claim is:—

1. A face mask comprising a bag of 90 flexible substantially gas-proof material into the open side of which the nose and chin of a person are to be inserted, means for holding the bag in position on the 95 wearer's face with one side of the opening held firmly under the chin, a deformable substantially non-resilient wire or bar extending along the other side of the opening and adapted to be bent to shape 100 that edge of the bag into conformity with the contour of the wearer's face, an inlet for connecting the bag to a gas supply, and outlet orifices in the wall of the bag.

2. A face mask according to Claim 1, wherein an inner bag is located within a 105 main bag of greater depth, the mouths of the two bags being co-extensive, the gas inlet leading into the main bag and the outlet orifices leading directly from the inner bag to the atmosphere, whilst 110 further orifices are provided in the inner bag to provide communication between the two bags.

3. A face mask according to Claim 1 or 2, wherein the means for holding the 115 mask in position on the wearer's face comprise an elastic cord loop extending through a channel along one side of the mouth of the bag and passing out through openings adjacent the edges of the bag. 120

4. A face mask according to Claim 3, wherein the non-resilient wire or bar is located in a channel along the side of the 125 mouth of the bag opposite to that along which the channel receiving the elastic cord loop extends.

5. A face mask according to any of claims 2 to 4, wherein the main bag and the inner bag are formed as a single unit 130 from two sheets of material stuck together

around their peripheries, one end of said unit being folded into the other end to form the inner bag.

6. A face mask according to Claims 3, 4 and 5, wherein the channels are formed by sticking together the main and inner bags either continuously or at intervals along lines adjacent and parallel to their mouths.

7. A face mask according to any of Claims 2, 5 and 6, wherein the gas inlet comprises a tube passing between the two sides of the main bag at the closed end thereof.

8. A face mask according to any of Claims 2, 5, 6 or 7, wherein the main and inner bags are stuck together over an area at one side thereof, and the outlet orifices are formed in the said stuck-together portions of the bags.

9. A face mask according to Claims 2 and 3, wherein the elastic cord loop passes

through guide members at the ends of the non-resilient wire or bar.

10. A face mask according to Claim 9, wherein the non-resilient wire or bar is a length of ductile wire having its ends bent to form eyes constituting the guide members for the elastic cord loop.

11. A face mask according to Claim 9, wherein the non-resilient wire or bar is a strip of ductile metal, and the guide members for the elastic cord loop are tubes of plastic material fitted on the ends of the said strip.

12. A face mask substantially as described with reference to, and as shown in Figs. 1 to 3 or Figs. 5 and 6 of the accompanying drawings.

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PROVISIONAL SPECIFICATION

Improvements in or relating to Face Masks for use in the administration of Oxygen and other Gases

I, GEORGE WILLIAM HIGGS, a British Subject, of 8, Duke Street, Wigmore Street, London, W.1, do hereby declare this invention to be described in the following statement:—

This invention relates to face masks for use in the administration of oxygen and other gases, and has for its object to provide a simple form of mask capable of being produced at a low enough cost to justify its being discarded after being used only once, thus avoiding the need for sterilization.

According to the present invention a face mask comprises a bag of flexible, substantially gas-proof material into the open side of which the nose and chin of a person are adapted to be inserted, means for holding the bag in position on the wearer's face with one side of the opening held firmly under the chin, a deformable substantially non-resilient wire or bar extending along the other side of the opening and adapted to be bent to shape that edge of the bag into conformity with the contour of the wearer's face, an inlet for connecting the bag to a gas supply, and outlet orifices in the wall of the bag.

An inner bag may be provided having its mouth co-extensive with that of the main bag, the outlet orifices leading directly from the inner bag to the atmosphere, and connecting orifices being provided between the two bags.

In one form of face mask according to the invention, which will now be described by way of example, a main bag and an

inner bag are formed as a single unit from two sheets of plastic material such as polyvinyl chloride secured together at their edges by the known method commonly referred to as "welding." Each of the two sheets has two parallel side edges and tapered or rounded edges, and the sheets are secured together about their entire peripheries except where an inlet tube is sealed into the middle of one end of the unit, between the sheets.

The two sheets are then folded transversely to form a re-entrant portion at the end opposite to the inlet tube the re-entrant portion constituting the inner bag, which is substantially less deep than the main bag. The inner and outer bags are sealed together continuously or at intervals along lines parallel and adjacent to their common mouth to provide a channel around the said mouth, and a strip of flexible, substantially non-resilient material is housed in the channel along one side of the mouth. A loop of elastic cord is passed through the channel along the other side of the mouth, and is brought out through openings near the ends of the mouth, on the side provided with the non-resilient strip, so that part of the loop is external to the mask.

The two bags are sealed together over a small area at one side, and one or more orifices are formed in both bags within this area to provide an outlet. One or more orifices are also formed in the opposite side of the inner bag, to connect the two bags together.

The mask is fitted by placing the side of the mouth in which the elastic cord is housed under the chin, passing the external part of the elastic cord loop over the top of the head until it extends round the head just above the ears, and bending the flexible non-resilient strip to bring the other side of the mouth into conformity with the contours of the face across the cheeks and over the bridge of the nose.

Some of the air exhaled by the wearer into the inner bag passes out to the atmosphere through the outlet orifices, the rest passing through the connecting orifices into the main bag, where it mixes with oxygen supplied through the inlet, the air from the main bag, with the added oxygen being rebreathed by the wearer.

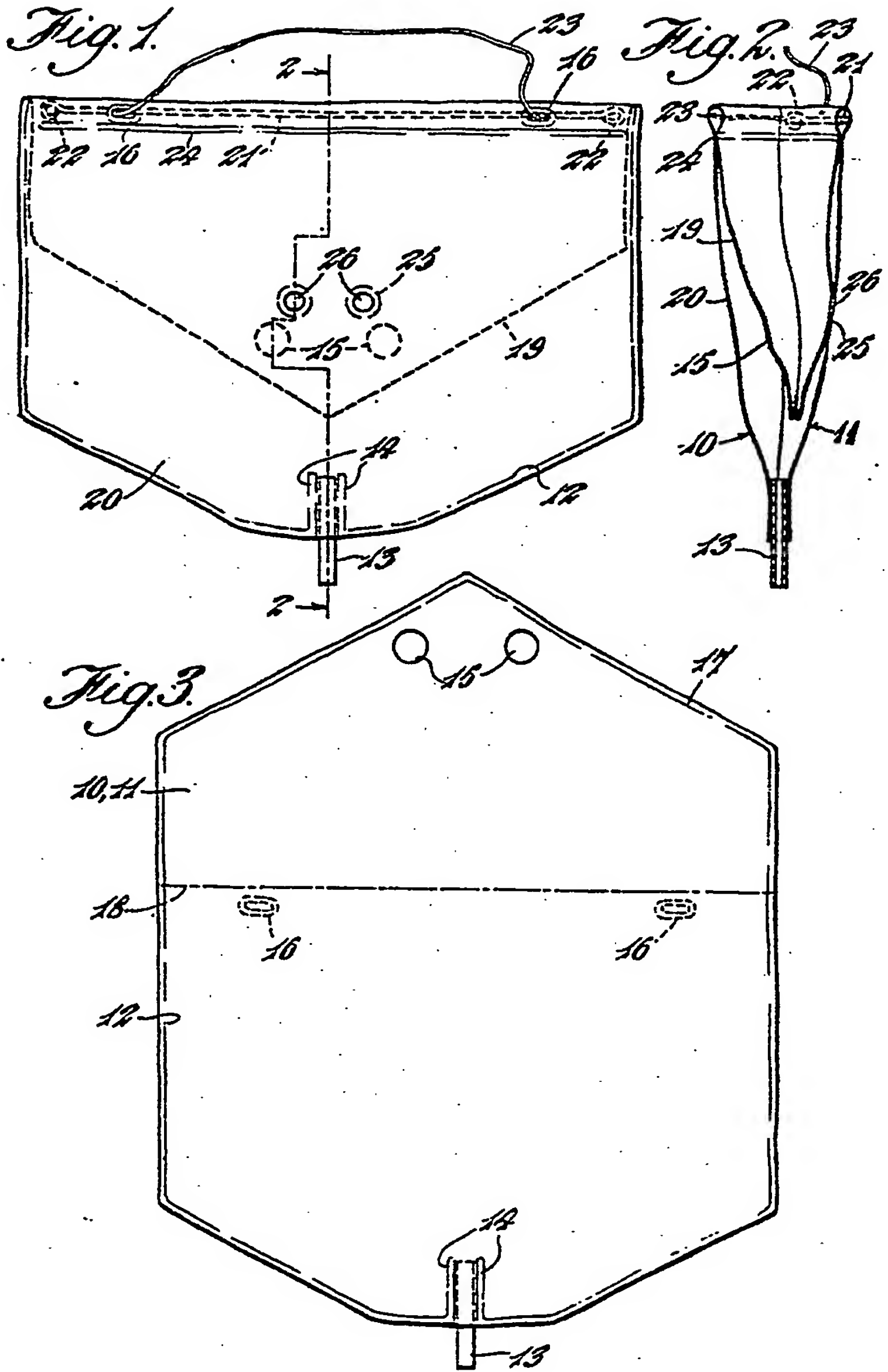
The mask according to the invention may be simplified by the omission of the inner bag, only a single bag being used,

in which case the outlet orifices lead directly from the main bag into the atmosphere, and the edge of the bag around the mouth being folded over and the fold secured to provide the channel for the elastic cord and the non-resilient strip.

The above described arrangements are only examples, and the face mask according to the invention may be modified in shape or construction without departing from the scope of the invention. For example, where both main and inner bags are used, they may be formed separately and subsequently secured together.

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COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of
the Original on a reduced scale.

SHEETS 1 & 2

Fig. 4.

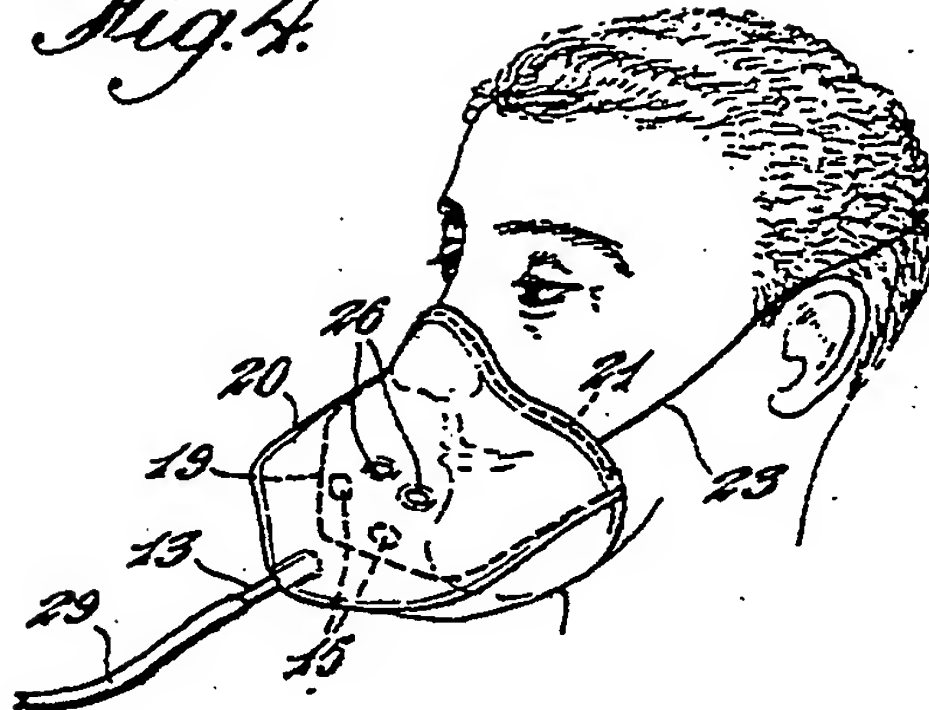


Fig. 5.

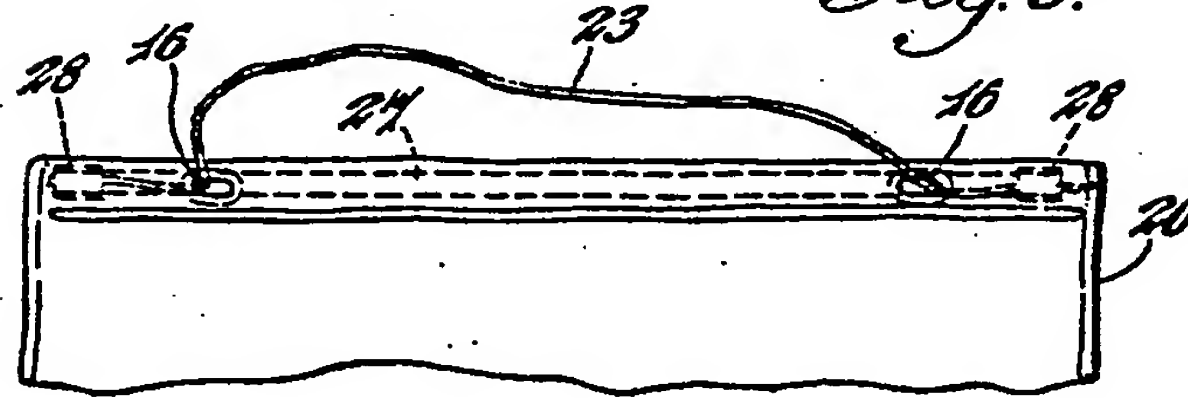


Fig. 6.

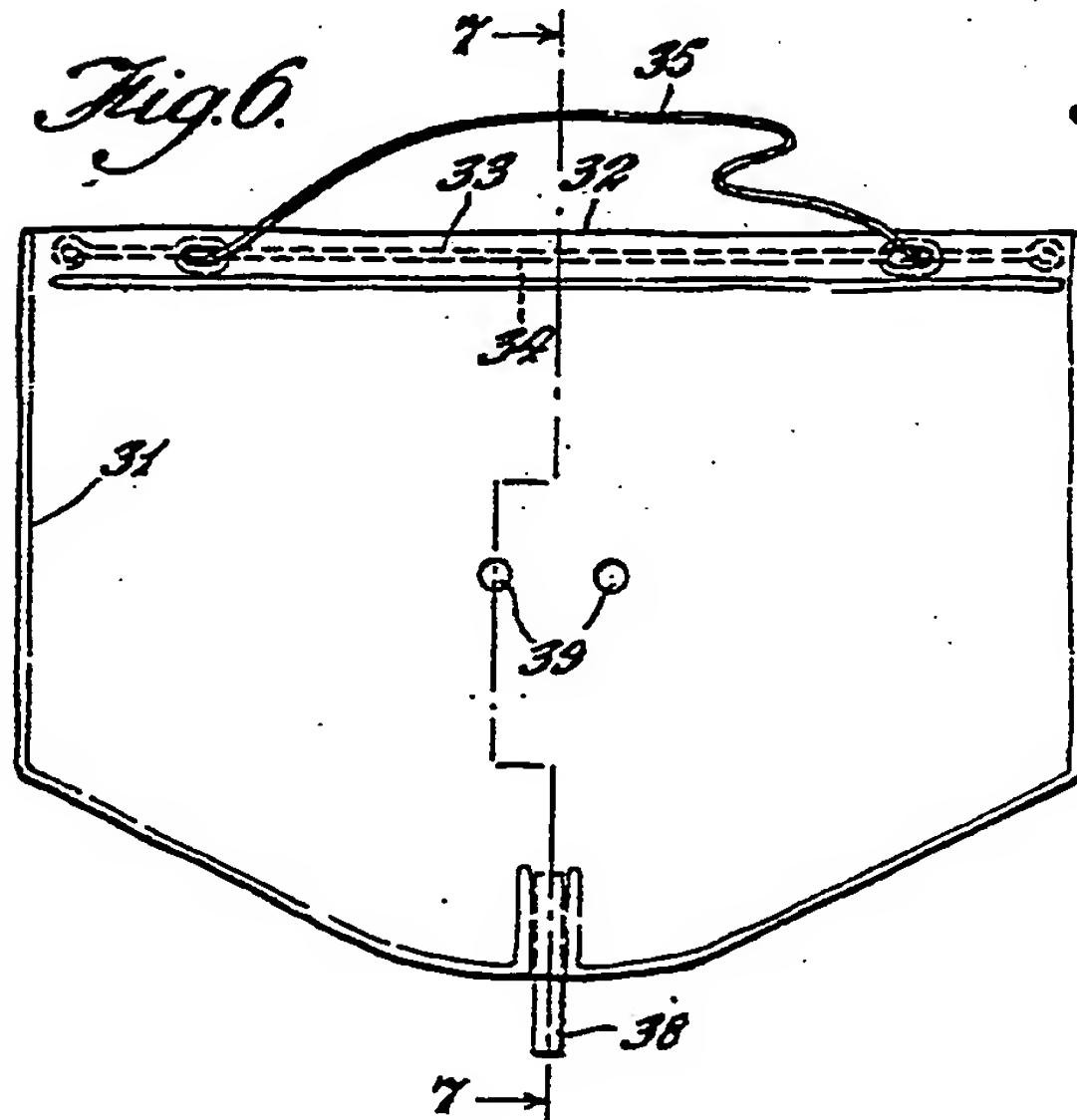


Fig. 7.

